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energetic man, grown portly with the years, but full strength and vigor.

He was on his way to "Stonecrop" his summer home at North Haven, Me., and it was a sad surprise to hear of his sudden death from apoplexy on July 27, 1917. If it had to be, it was a fortunate ending of a full life.

B. K. EMERSON.

FRANCIS HUMPHREYS STORER (1832-1914)

Fellow in Class I, Section 3, 1857

Francis Humphreys Storer, born in March, 1832, was a son of David Humphreys Storer, M. D. Harvard, 1825, from whom he inherited an ardent disposition, keen powers of observation, and an absolute sincerity in truth-seeking and truth-stating. His father belonged to a remarkable group of pioneering Massachusetts naturalists who were almost contemporaries in the second quarter of the nineteenth century. David Humphreys Storer published a "History of the Fishes of Massachusetts" in 1853-1867; George B. Emerson, Harvard A. B. 1817, published "Trees and Shrubs of Massachusetts" in 1846, a book which is still a classic; Thaddeus William Harris, Harvard A. B. 1815, published "Insects Injurious to Vegetation" in 1841, a pioneer entomological treatise of high merit; Augustus A. Gould, Harvard A. B. 1825, published in 1852 an important volume on the Molusca and Shells collected by the United States Exploring Expedition; Charles Pickering, Harvard A. B. 1823, published in 1848 "The Races of Man and their Geographical Distribution" (Vol. IX of the publications of the U. S. Exploring Expedition).

Francis Humphreys Storer grew up in this atmosphere of scientific research and publication, and was familiar with the scientific work of his father and of his father's contemporaries. Because of his own strong tendency to scientific studies his education did not follow the route ordinarily prescribed for the sons of successful professional men in Boston. He did not go to Harvard College, but to the new Lawrence Scientific School, where he spent the year 1850-51. For the next two years, he was by choice assistant to Professor Josiah P. Cooke of Harvard College, and then at the age of twenty-one he accepted an appointment as chemist to the United States North Pacific Exploring Expedition, and spent a year at sea and in numerous Pacific

ports. At Commencement, 1855, he received on examination the Harvard degree of Bachelor of Science, and immediately went to Europe to pursue the study of chemistry in German laboratories.

On his return from Europe, in 1857, he forthwith opened a laboratory in Boston as an analytical and consulting chemist for all manufacturing, pharmaceutical and commercial purposes; and this laboratory he maintained with great industry and success for eight years.

When Professor William B. Rogers, the founder of the Massachusetts Institute of Technology, was organizing the first Faculty of that School in the spring of 1865, just at the end of the Civil War, his choice for Professor of General and Industrial Chemistry fell upon Francis Humphreys Storer, then thirty-three years of age. President Rogers's plans for creating a strong School of Technology in Boston commended themselves very much to Storer's judgment; and he was also eager to attempt to teach chemistry by the laboratory method, a method strongly favored by Professor Rogers in all the sciences. At the same time his friend and fellow-student under Professor Cooke, Charles W. Eliot, was appointed Professor of Analytical Chemistry in the Institute. In the fall of 1865 these two young professors began work on the Institute's first classes in some hired rooms on Summer Street, but were soon called on to plan and equip the chemical laboratories in the Institute's new building on Boylston Street. These laboratories were planned for teaching chemistry to all students, young or old, beginners or adepts, by the laboratory method. In these convenient and spacious laboratories Professors Storer and Eliot were soon experimenting not only on the students of the Institute but also on classes of teachers, both men and women, employed in schools in and about Boston. They soon found that a laboratory manual was needed for the use of their inexperienced students; and they accordingly wrote together a "Manual of Inorganic Chemistry" which was the first of its kind to be published in the English language, or indeed in any language. In order to make this book as good as possible for its novel uses, the authors used it in proof sheets for a year in their own teaching, with both their younger and their older students, and by this method effected within the year many slight and some substantial improvements in the text. This book attained a large circulation, and was kept alive for nearly fifty years by rather frequent revisions, at first by its authors, and later by younger men acting in association with Professor Storer. The two comrades also issued a "Manual of Qualitative Analysis" intended to promote the same method of laboratory teaching.

In 1869, Charles W. Eliot became President of Harvard University, and one of the first subjects to which he gave attention was the immediate establishment of the Bussey Institution, for which large funds had been accumulating for several years in possession of the University. These funds were invested chiefly in mercantile buildings in the heart of Boston, the income from which was satisfactory, and looked secure. The fine estate of over two hundred acres in West Roxbury, which Mr. Benjamin Bussey had left to the University, was in good order and ready for the service of the Bussey Institution as Mr. Bussey contemplated it. Accordingly, in 1870, a building was planned and put up containing the laboratories, lecture-rooms, library and offices of the Institution, and the work of creating a small Faculty for the Institution was begun. The professorship of Agricultural Chemistry was offered to Professor Storer; and was accepted by him in 1870. A year later he was made Dean of the Bussey Institution, an office which he held, with his professorship, till his retirement in 1907. Here the main work of Professor Storer's life was done. It began under the most favorable conditions, with adequate laboratories, including glass-houses, good experimental fields, and a sufficient income to cover not only teaching, but research. In June, 1871, he married Catharine Atkins Eliot, a sister of President Eliot, and the married pair occupied a house near the main building of the Institution.

In November, 1872, the great Boston fire occurred; and in that conflagration several of the best buildings in which the Bussey Fund was invested were destroyed, and the insurance on them was lost in part through the failure of the insuring companies. A large subscription was raised by the alumni and friends of Harvard University to make good its losses in this fire; but the Corporation of that day thought it best to use the whole of that fund to make good other losses which the University had suffered, and to give the Bussey Institution no advantage from it. Hence the cash income of the Institution was seriously and permanently reduced; and in consequence Professor Storer's department and the general activities of the Institution of which he was Dean were seriously crippled. This loss altered the subsequent tenor of Professor Storer's life. He continued to teach and study with enthusiasm; but his pupils were few in number, and his research work was painfully restricted. Nevertheless, he produced under these untoward circumstances his principal book, two volumes on "Agriculture in Some of its Relations with Chemistry," constructed out of his lectures during twenty-five years, and first

published in 1897. This is a treatise of large permanent value, although agricultural science has developed rapidly during the twenty years since the book appeared. The scientific farmer of to-day may find in it innumerable facts and much reasoning of great value to him. The two volumes are affectionately inscribed to his father, of whom the son says, "To whose zealous example and constant encouragement are to be attributed whatever of scientific purpose may be found in them." In the last paragraph of the preface the author urges upon his reader, as he had been accustomed to urge upon his pupils, the great importance of studying two books by Professor Samuel William Johnson of Yale University, entitled "How Crops Grow" and "How Crops Feed," and remarks "Not a few points have here (that is, in Professor Storer's book) been lightly touched upon or even wholly omitted, simply because full explanations concerning them may be found in one or another of Johnson's books." Such remarks are distinctly unusual in the preface of one author about the publications of another on a similar subject. In this case the two authors were very unlike persons in temperament and habit of mind; but they were one in scientific spirit and desire to be serviceable.

During his long career as a chemist Professor Storer wrote numerous scientific communications for learned societies and contributions to the "Bulletin of the Bussey Institution." He also published two works which were the product of great industry and exactness in compiling all the accessible information on the subjects dealt with. The first of these publications appeared while he was a practicing commercial chemist in Boston under the title "Dictionary of the Solubilities of Chemical Substances." It was a work of great learning and great industry, which perfectly illustrates Storer's capacity for the patient labors of compiler and editor. A second publication of this sort appeared later in the "Cyclopaedia of Quantitative Chemical Analysis." Both these were works that could be carried on incidentally and without consecutive attention, in hours which other persons might have considered leisure hours. Professor Storer had no leisure. He relied for the preservation of his mental freshness and his bodily health on change of work, and a persistent habit of omnivorous reading.

After his wife died in 1882 he returned to Boston to live with unmarried sisters, to whom he was tenderly attached. An increasing deafness caused his withdrawal from most of his scientific fellowship and social intercourse during the last ten years of his life. He died 30 July, 1914, in the eighty-third year of his age.

CHARLES W. ELIOT.

Cambridge, 27 May, 1918.